

A1
Amend

b) spraying a silicon source material and a hydrogen peroxide (H_2O_2) in a gaseous state on the active matrix at a temperature ranging from approximately $-20\text{ }^{\circ}\text{C}$ to approximately $600\text{ }^{\circ}\text{C}$; and

c) forming the interlayer dielectric layer on the active matrix by a condensation reaction of the silicon source material and the H_2O_2 without performing a post thermal treatment.

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7. (Amended) The method as recited in claim 1, wherein a pressure in the chamber ranges from approximately 1 Torr to approximately 2 Torr.

REMARKS

By the present Amendment, Applicant has amended claims 1 and 7 to more appropriately define the invention. Claims 1-7 are pending.

In the Office Action, the Examiner rejected claims 1-6 under 35 U.S.C. § 102(e) as anticipated by Kirchhoff et al. (U.S. Patent No. 6,057,250, hereinafter "Kirchhoff"), and rejected claim 7 under 35 U.S.C. § 103(a) as unpatentable over Kirchhoff.

Response to 35 U.S.C. § 102(e) Rejection

For a proper anticipation rejection under 35 U.S.C. § 102(e), a single reference must teach, expressly or inherently, each and every element as set forth in a claim.

Claim 1 is directed to a method for manufacturing an interlayer dielectric layer comprising a combination of elements including, *inter alia*, "forming the interlayer dielectric layer on the active matrix by a condensation reaction of [a] silicon source material and [a] H_2O_2 without performing a post thermal treatment." In rejecting claim 1, the Examiner alleges that Kirchhoff teaches a method for forming an interlayer dielectric

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layer comprising providing an active matrix, spraying silicon source material and hydrogen peroxide on the active matrix, and forming an interlayer dielectric layer on the active matrix by a condensation reaction. The Examiner further alleges that Kirchhoff discloses that the silicon source material includes TEOS, boron, and phosphor. Applicant, however, respectfully submits that Kirchhoff does not teach at least forming the interlayer dielectric layer without a post thermal treatment.

Kirchhoff is directed to a method of forming a BSPG dielectric layer. Kirchhoff discloses that the BSPG layer is formed by mixing the following reactants: gaseous sources of TEOS, phosphorous and boron dopants, FTES, and gaseous sources of oxygen. Kirchhoff teaches that the reactants are deposited by a low pressure chemical vapor deposition. Kirchhoff, however, discloses that a high temperature annealing process is performed after the deposition (col. 6, lines 46-53 of Kirchhoff). Thus, Kirchhoff does not teach at least "forming the interlayer dielectric layer. . . without performing a post thermal treatment." Hence, Kirchhoff does not teach, expressly or inherently, each and every claim element, and therefore does not anticipate claim 1. For at least this reason, claim 1 is allowable.

Claims 2-6 are allowable at least due to their dependence from allowable claim 1.

Response to 35 U.S.C. § 103(a) Rejection

As set forth in M.P.E.P. § 2143, in order to establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim elements. Claim 7 depends from claim 1 and therefore incorporates the elements of that claim. In rejecting claim 7, the Examiner contends that Kirchhoff discloses the method of forming an interlayer dielectric layer except for

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the process parameters of the method. The Examiner alleges that it would have been obvious to one skilled in the art to optimize the process parameters to perform the method as recited in claim 7. Applicant respectfully submits that Kirchhoff does not teach or suggest all the elements of claim 7.

As stated above, Kirchhoff fails to teach or suggest at least "forming the interlayer dielectric layer. . . without performing a post thermal treatment." Further, the Examiner admits that Kirchhoff does not teach the process parameters recited in claim 7. Thus, Kirchhoff does not teach or suggest all the elements of claim 7. For at least this reason, claim 7 is allowable.

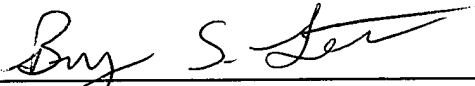
In view of the foregoing, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

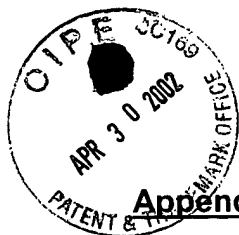
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Dated: April 30, 2002

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Appendix to Amendment of April 30, 2002

IN THE CLAIMS:

Please amend claims 1 and 7 as follows:

1. (Amended) A method for [forming] manufacturing an interlayer dielectric layer, the method comprising the steps of:

a) [providing] setting an active matrix provided with a substrate and interconnections formed on [a] the substrate in a chamber;

b) spraying a silicon source material and a hydrogen peroxide (H_2O_2) in a gaseous state on the active matrix at a temperature ranging from approximately -20 °C to approximately 600 °C; and

c) forming [an] the interlayer dielectric layer on the active matrix by a condensation reaction of the silicon source material and the H_2O_2 without performing a post thermal treatment.

7. (Amended) The method as recited in claim 1, wherein [the step of providing an active matrix including carrying it out at a temperature and a pressure in the chamber range from approximately -20 °C to approximately 600 °C and] a pressure in the chamber ranges from approximately 1 Torr to approximately 2 Torr[, respectively].

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